NBC NIGHTLY NEWS - COLUMBIA DISASTER NEWS REPORTS (FEBURARY 2003)

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From February 2003 NBC NIGHTLY NEWS Reports in the days and weeks following the 2003 Space Shuttle Columbia Disaster

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the colombia's lost there are no survivors another american tragedy in space the space shuttle colombia breaks up over texas the lives of all seven on board lost a truly difficult day for all of us good evening i'm tom brokaw at the kennedy space center in cape canaveral florida with a special edition of nbc nightly news tonight here where there has been so much triumph tragedy it is deathly still this morning they were preparing for the routine return of the space shuttle columbia as it streaked high over texas headed for florida mission control began to express some concern about a loss of sensor data including temperature and tire pressure readings on the left side the shuttle with seven on board including two women and an israeli air force hero was traveling 18 times the speed of sound at more than two hundred thousand feet it was completing a health and science mission when all the communication suddenly broke off then in the skies high over texas a loud boom a fireball a catastrophic loss of all on board in a hellish explosion immediately the questions what could have caused the shuttle to disintegrate the first time in the history of the us space flight program that a terrible accident has happened on approach and landing we're covering this tonight from all angles from here at the cape from the johnson space center in houston on the ground in east texas and in washington where we begin now with nbc's robert hager tom tonight nasa says in the minutes before the shuttle was lost it lost data from a series of sensors back here near the left wing it's an area that could have been damaged back when the shuttle first lifted off and some insulation came loose and

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and some insulation came loose and banged up against the wing they know that much if it damaged heat tiles that protect the shuttle from searing heat all over its skin on re-entry that could have been trouble but first the sequence of the shocking event three two one we have booster ignition and liftoff of space shuttle columbia it had been a 16-day space flight for scientific experiments six u.s astronauts including two women and one israeli now this morning 808 eastern time as planned the crew is given the okay to come home you are go for the burn okay we copy go for the bird 8 15 am they're descending now toward cape canaveral but still 39 miles high traveling 12 500 miles an hour and the shuttle's skin is heating to 3000 degrees from friction as it enters the atmosphere suddenly 8 53 am the first hint of trouble sensors on the left wing go out one by one they measure temperature and pressure on hydraulic pumps and the tires 859 mission control calls on the radio in columbia houston we see your tire pressure messages and we did not copy your last roger the shuttle is now over central texas and this would be the last that's heard from it one minute goes by then this from a nasa commentator columbia out of communications at present with mission control as it continues its course toward florida more time passes agonizing while controllers frantically try to restore communication 906 a.m columbia houston uhf comcheck now terrible news witnesses in texas have heard deafening booms and seen flaming pieces of metal shooting through the blue sky some say it appeared to explode and break up many captured it on home video we live in a mobile home and it shook it was like boom i mean you know and that's what i thought something blew up it looked like just the vapor clouds as

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just the vapor clouds as the separate pieces were separating 9 16 a.m by now the shuttle was supposed to have landed in florida nasa tells of a last desperate move search and rescue teams have been mobilized to the dallas fort worth area but there is no hope at 11 a.m eastern time the flag is lowered to half staff at the kennedy space center all seven astronauts are lost and through this long day small pieces of wreckage are beginning to be found strewn over a wide area of southeast texas and even into louisiana this sad event comes 17 years and four days since another shuttle the challenger blew up after liftoff that investigation took more than four months and grounded the rest of the shuttle fleet for nearly three years already now a high-level commission has been appointed to supervise this investigation it'll be looking into the question of those heat tiles and many more possibilities that could have caused this tragedy tom thanks very much nbc's robert hager tonight back here at cape canaveral at the kennedy space center columbia's crew was just minutes away from wrapping up a 16-day science mission research on the effects of space on astronaut health and science experiments in zero gravity nbc's kerry sanders tonight with more on this very accomplished group of scientists in space the commander of the mission was rick husband a 45 year old air force colonel from amarillo texas who wanted to be an astronaut from age four the former test pilot got his dream nine years ago this was husband's second shuttle mission in an interview before his first in 1999 he said even with 3 800 flight miles under his belt you never take anything for granted sometimes you get to the point you think let's see did i look at that did i look at that you know so i kind of feel like you have to go through a lot of last-minute checking to make sure that you've got things fresh in your mind that everything's ready to go mission pilot william mccool was in the

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mission pilot william mccool was in the left seat in the cockpit a 41-year-old father of three from lubbock texas a graduate of the naval academy this was his first shuttle mission and just last week from space he spoke to his hometown tv station addressing his former military colleagues as the u.s prepares for war i feel uh like saying a prayer basically for for them all and for the world as a whole that we don't have to go to war payload commander michael anderson from spokane washington was one of seven african-american astronauts since childhood an avid science fiction fan who dreamed of flying a lieutenant colonel in the air force this was his second mission his responsibilities included overseeing dozens of science experiments kalpana chaula was born and raised in india she hoped to design aircrafts never imagining she'd become an astronaut casey would always say that her retirement dream was to go be a bush pilot someplace david brown a captain in the u.s navy was a pilot and a doctor and was once a circus acrobat he was 46 years old on his first space flight his father today well i'm getting real cheery about it but he died doing what he wanted to do laurel clark was a navy doctor who dove the depths of the ocean before exploring the heights of space a 41 year old mother of one clark was on her first mission she was upbeat this morning hours before the scheduled landing we're getting ready for a big day up here had a great time on orbit and really excited to come back home tonight all of israel is mourning its native son the first person from that country to go into space 48 year old ilan ramon he was married with four children the seven crew members of the space shuttle columbia who were supposed to land here today included five men one african-american

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included five men one african-american one israeli and two women one an indian-american a true cross-section of the united states and the world carrie sanders nbc news cape canaveral florida now more on the investigation nbc's robert bazelle who has followed the shuttle program from the beginning is following the effort already well underway to find out how this might have happened the original within minutes of losing contact with colombia officials in mission control took steps to preserve all the measurements of temperature altitude speed and hundreds of other variables recorded during the shuttle's descent we will be pouring over that data 24 hours a day for the foreseeable future investigators caution against jumping to conclusions but the biggest suspect now that piece of insulation that hit the tiles on the left wing during liftoff the tiles are critical for protecting against heat damage during re-entry into the earth's atmosphere if several of them

somehow were dislodged you worry about that hurricane hurricane force wind on re-entry ripping more and more tiles off and then if that's the case the heat could melt through the aluminum skin of the orbiter how will investigators know whether tiles failed the biggest clues will come from those hundreds or thousands of pieces of debris strewn across parts of texas investigators are not certain whether they will try to reassemble them all as they did with the remains of twa flight 800 but they will examine every one we have to look at it in two different ways was there an in-flight breakup that resulted in an explosion of the aircraft or was there an explosion that resulted in an in-flight breakup there's two ways to look at it the evidence that is the parts that have been found are going to be key to trying to determine what happened first while the investigation unfolds the shuttle program remains on hold meanwhile three people remain in orbit on the international space station they had expected to come home on the shuttle but nasa officials said today

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shuttle but nasa officials said today the three have enough supplies on board the space station to last through june and if need be they can be resupplied or go home with russian rockets while american officials try to figure out what happened to the shuttle robert bazelle nbc news new york now let's go to east texas where pieces of columbia's records fell across the countryside this morning nbc's jim cummins heard the tremendous sound from that accident and he joins me now from texas jim what's the latest there hi tom this morning my wife and i were sitting at our home in dallas reading the newspaper when we heard and felt a loud explosion it was like a sonic boom and it rattled the walls of our house my wife ran outside to see if something happened to one of the neighbors and then we learned 20 minutes later on the today show that somewhere over texas nasa had lost contact with the space shuttle columbia several camera crews and i scrambled toward east texas following reports that debris from the space shuttle was raining down over hundreds of square miles this was the largest piece that we found from dallas to the louisiana state line one piece of debris is as big as a car door others as small as a penny hit right there in the ground a little divot and bounced over i thought my hot water heater had exploded there were hundreds of reports of debris landing in the small city of nacogdoches texas population 30 000. dozens of small pieces of the shuttle landed on neighborhoods and in backyards the authorities passed along a warning from nasa for everybody to stay away from any debris they found because it could be contaminated with hazardous materials from the shuttle like rocket propellant or even radioactive material clearly its federal property should not be taken and that would that would uh not be an appropriate taking of that property it gets a little scary teal hamilton said he heard what sounded like an explosion and ran out to his front porch i thought somebody had an accident on the highway it was so loud you know and i looked out and i saw the limb shaking in the trees what's going on that big piece of metal come floating down

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come floating down bonnie kirk will never forget this day i heard a noise and it sounded like somebody jumped on top of my house walking around somebody big the debris narrowly missed her i feel blessed that nothing hit my house you know and i'm thankful and but it's just scary that stuff takes place like this fortunately a national guard unit was on maneuvers in the area and is helping with the cleanup they are treating the area around every piece of debris like a crime scene tom thanks very much nbc jim cummins tonight in texas nbc's kelly o'donnell at the johnson space center in houston where they monitor all of this kelly what's the latest from there good evening tom here at the johnson space center competing emotions raw grief and a promise of determination to root out a cause for this first ever nasa disaster on re-entry now this is what it looked like a national weather service radar a red streak across the start the sky appearing to be the shuttle as it is breaking up another piece of data that may help guide investigators comes from the military nbc news has learned that highly sensitive infrared technology satellite imagery detected what's known as a heat spike and that technology is a dsp satellite first developed to detect soviet missiles now the structure of the investigation here is quite broad inside nasa every team shuttle team is assigned a what-if scenario and that team is already deployed to try to find out what happened among the things they're doing impounding all of the sensitive data from computers and so forth to try to analyze that they're also planning for a collection site where they may put debris to further analyze whatever wreckage is found on the outside

of nasa there is a special team known as a mishap investigation board they've already been set up from across the federal government and the military to take a look at what has happened now one of the mission leaders here expressed apprehension today saying

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expressed apprehension today saying that when you consider the wreckage in a debris field so vast as we've heard and subjected to heat so intense perhaps as great as three thousand degrees will anything left behind be able to reveal significant information they just don't know and here tom there are signs of just how personal this loss is outside the johnson space center a spontaneous memorial the flowers and candles brought by people who just wanted to show some expression and inside here expressions from the mission leaders near tears not only talking about the pain of losing friends but expressing the burden of wondering if there was something anything they could have done in planning to prevent this tom thanks so much nbc's kelly o'donnell tonight with so much going on in the world at the moment including of course the possibility of the united states getting ready for an attack on iraq it was a blow from out of the blue for the president who was at camp david when he got the news about colombia breaking up the loss of life nbc's david gregory joins me now from the white house with more on this sad day for the president and the nation david tom it fell to an emotional president bush this afternoon in an address to the nation to confirm what had become painfully obvious by mid-morning his words quote the columbia is lost there are no survivors by midday the president's motorcade was quickly returning to the white house from camp david where just after 9 a.m this morning his chief of staff andy card told him the shuttle was lost just after 2 pm mr bush addressed the nation this day has brought terrible news in great sadness to our country earlier as the president ordered the flags above the white house and all federal buildings lowered to half-staff he called the crew's family members gathered in a conference room at the kennedy space center saying at one point quote i wish i was there to hug and cry and comfort you right now commander laurel clark

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commander laurel clark captain david brown the president named each crew member names little known in the country before today and praise them for their daring and idealism these astronauts knew the dangers and they faced them willingly knowing they had a high and noble purpose in life the president who spoke to numerous world leaders including israeli prime minister sharon expressed his commitment to nasa's mission our journey into space will go on and in tribute to the astronauts spoke of god the same creator who names the stars also knows the names of the seven souls we mourn today the crew of the shuttle columbia did not return safely to earth yet we can pray that all are safely home the president who tried to reflect the nation's grief today felt his own aids say after his phone call to the crew's relatives in florida the president walked out of the oval office into his private study to spend a few moments alone tom thanks very much nbc's david gregory at the white house tonight this country space program has had spectacular success of course it now seems routine when things go well but still as we always know it's inherently a risky business today was a struck reminder of that nbc's brian williams joins me now from new york with more on that part of the story brian tom the american space program is a story of astounding even towering successes 144 manned space flights and it has been forced to go on at times despite some rare crippling and wrenching disasters the colossal failures of the early space program embarrassing and spectacular as they were all took place before nasa ever dared to put a man inside a capsule

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ever dared to put a man inside a capsule it was after years of great success in both the mercury and gemini programs that nasa suffered its first genuine catastrophe before it was ever able to leave the ground the three-man apollo moon launch program was staggered when the launch pad fire took the lives of apollo 1 astronauts grissom white and chafee three years later apollo 13 had to call off its moon landing the only failure in a long line of moon missions all ending safely january 28 1986 the first teacher in space christa mcauliffe is among the seven on board her parents are there as a spectacular launch goes tragically wrong

flight controllers here looking very carefully at the situation obviously a major malfunction ronald reagan is called upon to comfort the grieving families and an entire nation watching in disbelief as the tragedy played out we will never forget them nor the last time we saw them this morning as they prepared for their journey and waved goodbye and slipped the surly bonds of earth to touch the face of god and now it falls to another american president to do the very same thing joining us now from washington a veteran of america space program captain rick houck who commanded the first space shuttle to go up after the challenger disaster captain good evening and welcome what is the dynamic that we will now see again that put you behind the stick of a flight knowing the last one had gone down well uh nasa had never left lost any people in space before they had the terrible apollo 1 fire but you're faced with the fact that you know that you're in a very risky business and butterflies in the stomach heart racing

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butterflies in the stomach heart racing at liftoff you get into space and that's a very benign peaceful time frame but then you come back for the landing and at the time that this happened they were strapped into their seats with the exhilaration of knowing they were coming home and they were literally uh powerless to do anything about this what does this do in your mind to the prognosis for the shuttle program and after the initial horrible sadness dies down can a good come out of it well there's always good that can come out of anything like this especially when you have so many talented people that are focused on the causes and this this cannot be the end of this shuttle or space program uh we're too much of an adventurous nation to let that happen captain rick houck thank you for being with us in washington tonight now back to tom brokaw at the cape tom thanks very much uh brian williams tonight when word first came of what had happened many of us wondered the same thing could this have been an act of terrorism nbc jim kloszewski joins us now from the pentagon with more on all that jim what are they saying there tom nasa and military officials move quickly to try to shoot down any theories that today's tragedy was an act of terrorism at the very outset nasa ruled out the possibility colombia was brought down by terrorists at this time we have no indication that the mishap was caused by anything or anyone on the ground u.s military radars detected nothing in the air that could have hit colombia there's no anti-aircraft missiles in the world with the range and speed to have reached the columbia shuttle the longest surface-to-air missiles can only reach an altitude of 95 000 feet shoulder-fired missiles like the stinger have a range of only five miles far short of the columbia's flight path it was moving at approximately twelve thousand miles an hour at an altitude of two hundred thousand feet and there literally is no surface-to-air missile made today that would have taken it down

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it down but what about a bomb on board highly unlikely since the terrorist attack on 911 nasa has had extraordinary security around all shuttle launches security was even tighter for this flight because one of the astronauts elan ramon was israeli now the internet's already humming tonight with theories connecting colombia to terrorism or even the standoff with iraq the conclusion here this was nothing more than a tragic accident tom thanks very much nbc jim mccloskey at the pentagon tonight more reaction from around the world to this shuttle disaster on this day at the vatican the pope prayed for the seven astronauts during mass at saint peter's but in iraq the disaster is being called god's retribution on americans one iraqi government employee said quote we are happy that it broke up in israel tonight there is overwhelming sorrow as you might expect this was supposed to be the day that a national hero the first israeli astronaut returned to earth his accomplishment as a payload specialist overshadowing just for a moment the violence and instability that typify israeli life these days instead this nbc's tom aspell is in tel aviv tonight he was israel's first astronaut and a rare spark of hope and pride for a troubled nation but tonight israel is mourning for colonel ilan ramon the disaster really hit all of us right right in the heart and really is a very sad day today in an israeli television studio ramon's 79 year old father watched helplessly as controllers lost contact with his son's space shuttle he was helped from the studio in shock his wife and four young children were in these bleachers at cape canaveral waiting to watch the landing prime minister ariel sharon accepted condolences in a phone call from president bush it's on these moments these tragic moments uh that uh that the hearts of the

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uh that uh that the hearts of the american people and the hearts of the israeli people are bonded together in a country that reveres its military heroes ramon was a standout he was a fighter pilot in the 1973 yom kippur war he piloted an f-16 that bombed an iraqi nuclear reactor in 1981. his mother and grandmother were survivors of the nazi death camps in world war ii on his shuttle flight ramon carried their pictures along with a small jewish prayer scroll kept safe by a young jewish boy during the holocaust he was known as a dedicated family man who was constantly reassuring his children that his space mission was a safe one uh no i'm not worried because um i mean he's not worried so why should i be worried just weeks ago ramon told israeli television the chances of something going wrong were less than one percent and insisted that nasa was being extra careful about flight safety ramon viewed his space flight as an opportunity to help israel and dedicated his mission to jews all over the world tonight he's mourned here as a hero who died serving his country tom aspell nbc news tel aviv and india tonight is also devastated by the loss of a national heroine the first indian-born astronaut to fly on a u.s space mission people there had planned to celebrate the shuttle landing but when word of the disaster came they streamed out of their homes to offer prayers instead seventeen years and four days have passed since the country was devastated by the explosion of the shuttle challenger tonight the familiar feeling of shock and loss and it comes at a time when there's a possible war in the immediate future americans are already on edge here's nbc's roger o'neill from maine to california sea to shining

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from maine to california sea to shining sea a nation grieves words of condolence i just feel so sorry for all the people involved and their families as the flag flew half staff over the nation's capital a father and son went to the nation's air and space museum joshua lawrence wanted to learn about those who reach for the stars i'm just shocked about what's happening they were risking their lives to better mankind word of columbia lost knocked the wind out of us and like 17 years ago when the challenger shuttle launched columbia returning from space this morning had become routine no big deal now though another tragic reminder of the risk of space accepted by the astronauts but so hard on families christa mcauliffe was to be the first teacher in space her friends on today's tragedy goodness to hear this today brings it all back in the kind of tragic way we felt it 17 years ago at a permanent memorial to krista in concord new hampshire where she taught a young boy was thrilled to sit in a mock-up of the shuttle this morning learning only minutes later a real shuttle had just blown up you dream about what your kids might do when they get older we were pretending to be pilots and then you come out here and you know find out that a shuttle is crashed it's just scary kids always seem more interested more attuned to space exploration and colombia's mission was no different at the shoshone indian reservation in fort hall idaho 10 students had a science project aboard colombia made me feel kind of mad and kind of sad at the same time but i was trying not to think about it because if i think about that then i'll probably tear me down for a while as word of the fate of colombia spread a nation divided over a pending war with iraq seemed to lay down those arms and unite

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seemed to lay down those arms and unite in its morning at one piece vigil in orlando a woman said we are all human beings our hearts and tears go to the families we are all touched colombia launched from the kennedy space center 16 days ago thousands were there this morning to watch its triumphant return instead tears over an empty launch pad and a flag at half staff roger o'neill nbc news atlanta now with your permission some personal thoughts coming back here to the kennedy space center is always an evocative experience for me i was here in 1981 for the launch of the first shuttle and then of course that triumphant day when john glenn a grandfather went back into space the kennedy space center here in florida remains an impressive place with the outsized american flag on the vehicle assembly building behind me tonight in muted light no amount of time however has dulled the excitement of a shuttle lifting off from the pad nearby april 1981 that first launch the bold and daring way to carry humans beyond the bonds of earth january 1986 the risks of the explosion on takeoff of the shuttle challenger then today february 1st another reminder of the

great risks of great enterprise the great courage required the sacrifice to expand the limits of our place and space to expand our knowledge a thousand years from now this will be a monument to all of that and more tonight it is however a place of mourning and heartbreak [Music] the day after the disaster that struck down the shuttle columbia bring sorrow and prayers across the nation now the grim search for the fallen

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now the grim search for the fallen and the beginning of the hunt for answers nbc news this is nbc nightly news with brian williams reporting tonight from the johnson space center in houston good evening from the johnson space center here in texas the sprawling complex that was built during the years of the race to space that race has been over for some time but the united states stayed in the space business the form of the shuttle program which has now suffered a second catastrophic failure tonight we know more about what might have happened at that altitude 38 miles above the u.s when the shuttle went down here on the ground in texas the effort to find the pieces of wreckage scattered on the earth from the crash and the loved ones these seven astronauts left behind that is why president and mrs bush will head here to houston for memorial service on tuesday we have complete coverage for you tonight beginning with nbc's robert hager on the investigation and the spacecraft that was doomed brian just before this accident data now shows that there was drag on this left side of the shuttle something trying to bank it this way hold it back on this side could be it was shedding heat shielding tiles about that time too there were sensors flickering off in the wheel well underneath and heating along this wing here so could tiles have come off permitting heat to damage the wheel well maybe even dropping down the landing gear door investigators don't know tonight but there's this from shuttle manager ron dittemore we had a an increase in drag on the left side of the vehicle it can be indicative of rough tile it can be indicative for perhaps missing tile we're not sure yet as searchers located nearly a thousand

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searchers located nearly a thousand pieces of small wreckage the decision was made to truck anything that looks crucial to barksdale air force base in louisiana for closer examination this as nasa's administrator sean o'keefe insisted on nbc's meet the press that a wide variety of potential causes will be considered we're not going to rule out any theory at all of what could possibly have caused this terrific accident and as a result we're going to make sure we examine all the evidence to head the investigation o'keeffe today appointed retired admiral harold gemman earlier gavin co-chaired an investigation of the terrorist bombing of the uss coal in yemen two years ago important in the shuttle probe will be the sequence of events over the last seven minutes before the shuttle broke up it was just at the point of maximum stress re-entering the atmosphere when searing temperatures on the wing and underside can reach three thousand degrees in those seven minutes key sensors along the left wing began failing one by one ending in some kind of catastrophe yesterday you informed me of a report from california about an observer seeing what in what was indicated to be debris shedding from the orbiter we have talked to that observer and we have his written statement we believe that is important to us the timing has drawn initial attention to the shuttle's protective heat tiles which could have been damaged when the left wing was struck by debris at liftoff this is believed to be a picture of that moment tiles have caused troubles before in 1985 after the shuttle discovery landed a number of tiles were found missing from one of the wings and bad scorching of the aluminum shuttle skin underneath was clearly visible and back when the shuttle columbia was first being prepared for space flight in 1979 there were severe problems of fixing the tiles and its first launch had to be

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tiles and its first launch had to be delayed meantime questions are being raised about what nasa are the astronauts could have done if they'd wanted to check further and see if the tiles were damaged there was no long mechanical arm on this flight that could have got a picture of the tiles no docking mechanism to hitch to the international space station let the astronauts bail out there no astronaut on the shuttle that had been trained to replace tiles in a space walk and even if they could have there were no replacement tiles aboard

the columbia so some say tonight that if the tiles had been severely damaged the astronauts may simply have been doomed ryan robert hager here with us at the johnson center in houston there is so much debris on the ground here in texas one sheriff in the northeast part of the state said there's more debris than manpower to pick it up the debris field is enormous it's hundreds of miles long and several counties wide at one point nbc news national correspondent jim avila is in one such texas town where they're measuring this tragedy piece by piece jim good evening good evening brian we're standing at the toledo bend reservoir part of the impact zone of colombia and here they used horses boats uh satellites even to look today for evidence some proof of what would have happened to colombia over the texas woods they came by the busload more than 200 searchers most volunteer firefighters are off-duty police okay let's line it up walking ten feet apart some equipped with yellow backpacks carrying satellite gps some on foot others on horseback and all supervised from the air by a nasa helicopter 250 square miles more than 150 pieces of debris already found over rough terrain a lot of hills and a lot of valleys and ravines and creeks there that they will happen to be cert searching it's extremely difficult from obvious spaceship wreckage metal five feet tall now standing alone in the texas woods to an astronaut's dented helmet and a

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to an astronaut's dented helmet and a sky blue patch intact undamaged unburned in its 39-mile fall to earth it's emotional for everyone because all of us have a involvement in the space program columbia's metal debris vital to the investigation what searchers find in the texas woods today may help tell the story of what happened on reentry trying to determine was it an explosion that caused the in-flight breakup or was it an in-flight breakup that caused the explosion the volunteers also carefully looking for human tissue in the woods more found today remains now marked by a simple cedar cross built by roger and jeannie cody i have been disturbed by what i saw and what i've heard since late today a setback a recovery mission on the toledo bend reservoir comes up empty when two police boats looking for the single largest piece of wreckage strike out fishermen gave these gps coordinates in shallow water but nothing was found it should be easy to sleep in that shallow water we're not seeing anything so tonight this reservoir still holds what could be a critical large piece of the wreckage they'll search again tomorrow brian jim avila thank you for that and to another texas town now where picking up this debris was a day-long event nbc's jim cummins is in nagadosha texas tonight and i walk and see today adana hagel made this discovery by the azalea bush in her front yard a circuit board from the space shuttle columbia and i walked around and i saw that just one more piece of debris in the small city of nacogdoches texas which was showered with the wreckage more than 500 pieces inside the city limits alone all sizes and shapes at least a hundred pieces are now under 24-hour military surveillance sometimes the debris is barely noticeable here along sheffield drive in nagadosha's a piece of what appears to be tile landed on the road sat here for three hours and presumably was driven over by cars eventually the fire department came here and put it over here on a water beater

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and put it over here on a water beater box in this front yard cheryl chris found it while she was out for her morning walk it said not to touch it too dangerous and i quit walking after that i was afraid something else might fall and then there's a debris that has disappeared that's where it hit and just shattered them local district attorney ed klein points to several holes in the roof of his mother's home but he can't find the debris that caused the damage one or two things happened it either hit the roof and bounced off and did not penetrate into the to the attic or it just disintegrated into little pieces authorities here say they are still fielding calls about shuttle debris at the rate of 25 an hour they say at least 70 people have gone to the er to be checked for contamination you think it's a circuit board so far everyone okay jim cummings nbc news nacogdoches texas now to the staggering loss this accident represents in human terms these were seven extraordinary individuals some of america's best and brightest they were moments away from ending what they thought would be a successful nasa mission few people knew their names up until yesterday their stories are incredible here is nbc's carrie sanders the columbia 7 anderson brown chavla clark husband mccool ramon they were astronauts who died on this the 113th shuttle mission but to their families they were dad and mom the uncle who was once a circus acrobat the daughter who was a deepwater diver she was

just very very loving um and maybe loving isn't the right word very caring across the country today families talked of their loved ones and why they did what they did despite the danger he knew what the dangers in it we did too but i can feel

00:40:02 (https://www.youtube.com/watch?v=0zQVeqrjJI0&t=2402s)

dangers in it we did too but i can feel sure that by him being a christian man you know that he is in a better place than what he would have been here on earth so that's one good thing that helps to me to bear the situation today they were all high achievers but also dreamers from childhood fascinated by flight by science and the unknown and they were pioneers casey as she was nicknamed the first and only indian american astronaut elon ramon the first and only israeli astronaut and michael anderson one of only seven african-american astronauts i mean it's sad to lose anybody but the number of african-americans is so small and they'll lose one on each flight ron mcnair and now uh mike anderson tonight a garden of tears has sprung up here at the gates to the kennedy space center while across the country americans search for a place to pay their respects and salute their heroes carrie sanders nbc news cape canaveral now to the impact right here in houston and you know the old-timers still call this space city the tight family known as nasa is hurting tonight our report on that from nbc's kelly o'donnell a company town coming together we're houstonians i mean that's what you're supposed to do mission focused that's part of life here the space program in general is very very positive and and all the things that it represents we we believe in a sense of pride that knows no earthly bounds after all the first word uttered from the moon 34 years ago tranquility base here the ankle has landed i think it's wonderful if the world thinks of space when they hear the word houston retired astronaut walt cunningham flew on the first manned apollo mission apollo 7 and knows the bond between people who live here and their space program they know the astronauts in

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program they know the astronauts in their community they feel like their job their own personal efforts are going to contribute to keeping that man alive today everyone doing their part finding ways to express the loss kids with flowers a pastor with just the right words we gather today and remember all of the astronauts of the shuttle shuttle commander rick husband and payload commander michael anderson attended services here now friends pray for their loss the entrance to the johnson space center has long been a landmark now this spontaneous memorial is the attraction for a father trying to explain this all to his son celebrate the victories but help mourn the losses too right ten thousand people earn their living inside the fence as they say working at the johnson space center but everyone you meet here claims the space program as their own and the lives lost aboard the shuttle as a death in the family kelly o'donnell nbc news houston we're back in houston nbc news in depth tonight how this disaster might just force a good hard look at nasa's operations cuts in money and staff have raised questions recently then there's the larger question is there still a reason to send americans up into space and as we now know into great danger do americans still see space as the next frontier nbc news chief science correspondent robert bazelle tonight reducing the stress nasa insists the columbia tragedy will not detract from that goal our objective is to find out what caused this fix it and make sure that we support the dream the vision that those folks gave their lives to but for years nasa has been facing questions about just what people are doing in

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about just what people are doing in space since the challenger explosion the goal has been scientific experiments and construction of the international space station to allow people to live and work in space for months but experts like dr robert park say the science is just not that good i think it's fair to say that none of the science that has been done on the space shuttle or on the space station has significantly impacted any field of science that doesn't mean it's bad research but it's not terribly important generally why the shuttle and station fly in the same orbit john glenn achieved in his historic 1963 flight the russians kept the space station mirror aloft for years to study long-duration flight so much that can be learned is not already the space station was supposed to be bigger than mirror housing 12 astronauts but when costs climbed from 8 billion dollars to

150 billion nasa cut back so it can only house three the same as mir indeed because of the questions about its mission nasa lives with constant budget pressure many say it could threaten safety any program where you're dealing with aging equipment particularly if you're putting it under the stresses that the space shuttle goes under aging is a concern but what about the idea that the space program has given us all sorts of products from teflon to the artificial orange drink tang it turns out that most of these things were not developed by nasa or for nasa they were developed independently but the the makers found that it was good business to say that had been developed in the space station many would agree that america's space program sorely needs a vision when they say was lacking long before the columbia tragedy robert bazelle nbc news new york welcome back we're at the johnson space center in houston texas the president has said america's plans in space will go on despite

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despite the loss of seven brave souls so apparently will the president's plans perhaps to go to war against iraq how perhaps are the two related our report tonight from nbc news white house correspondent campbell brown campbell good evening brian well the president like much of the country was in mourning today but also still managing another crisis coming to a head this week as secretary of state colin powell goes to the u.n to make the case against iraq as baghdad braces for war word of the shuttle disaster brought defiant gloating from some there who called it god's vengeance for u.s policy toward iraq president bush attended church services in washington today where the reverend sermon denounced the iraqi words as quote garbage saying the columbia's loss was the price we paid for exploration while white house sources say the president and first lady are planning to travel to houston tuesday for a nasa memorial service the administration remains intently focused on pulling together evidence of iraq's weapons programs that secretary of state powell will put before the u.n security council wednesday today iraq challenged the evidence a spokesman accusing the u.s of doctoring it if we were given the opportunity to see those evidences in details we are able to prove that they are just lies and iraqi officials did agree to meet with chief weapons inspectors in one week to try to resolve a standoff over iraq's banning of surveillance flights and limiting interviews with scientists white house officials say the shuttle tragedy will not delay the administration's plans for iraq the president though will meet in the oval office tomorrow morning with sean o'keefe the nasa administrator for an update on the investigation brian campbell brown at the white house tonight thanks all across the country today you heard the same sentiment about the tragedy that brings us here to nasa in houston wasn't there enough sadness

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in houston wasn't there enough sadness already of late why did seven astronauts have to die tonight nbc's roger o'neal reports on this somber sunday across america seven bells seven candles [Music] the crew of colombia remembered in prayer and song this morning in houses of worship across america across the world as parishioners bowed their heads in prayer the son's reflection over the steeple of atlanta's second ponce de leon baptist church looked like a star those seven laid down their lives yesterday taking a risk for the benefit of us all in big churches and little churches all places of faith ministers spoke of sacrifice and courage and the faith of astronauts to explore frontiers near the kennedy space center one pastor called the trail of smoke from the shattered spacecraft a glistening tear across the face of the heavens in rome pope john paul said he will remember the astronauts in his prayers american soldiers in afghanistan remembered them too in a memorial service salutes came in many forms today nevada shelton wore his astronaut jumpsuit to church his dream to be an astronaut to be just like the columbia 7 still alive i just like to pay the respect to the astronauts and like me i want to be a future astronaut too sally ride the first american woman in space dreamed those same dreams today she tried to help children at a science festival in orlando understand what happened symbols of a nation in mourning are everywhere from 50 flags at half-staff at the

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from 50 flags at half-staff at the washington monument to a college lacrosse game in california the nation seems to take comfort in symbols in instant memorials and one is growing at the kennedy space center columbia's seven astronauts left from here now this is a special place left for them seven a number no one will soon forget roger o'neill nbc news atlanta finally tonight if we'd been asked just a few days ago how many people were up in space was there a shuttle mission in progress how many of us really would have known the answer perhaps now we will all pay a little bit more attention to the everyday miracles that occur in space like the fact that there are two americans and a russian orbiting in the space station as we speak the seven astronauts being mourned here in houston and elsewhere died quite literally on top of the world perhaps what goes on in space should be top of mind more often down here on earth that is nightly news for this sunday night a special edition of dateline this evening anchored by tom brokaw in new york i'm brian williams nbc news reporting tonight from good evening it appears tonight based on the early theories on what happened to the shuttle columbia that the flight may have been doomed from the start from shortly after takeoff when a piece of insulation from the external fuel tank tore away and banged into the left wing apparently it damaged some of the heat tiles which are there to protect the shuttle against the very high temperatures generated during re-entry that's the leading theory tonight and if it holds up the chances of fixing it during the flight were very remote this investigation is the immediate focus but the long-range future of the shuttle program also is in play and tomorrow the president will attend a memorial for the lost astronauts we're going to begin tonight with nbc's robert hager at the johnson space center in houston

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even though you might have localized structural damage you would not have damage sufficient to cause a catastrophic event nor impact the flying qualities of the vehicle here are pictures of that debris ripping off the external tank a minute 20 seconds after launch and hitting the shuttle in this close-up this is the external tank this is the nose and left wing of the shuttle watch now here's the insulation coming off the external tank now it disappears behind the wing which is when it strikes the wings underside then it re-emerges in a cloud of debris that could include some of the tiles it may have knocked off nasa saw this video a day after the launch and could have asked the military or spy agencies to try to get super close-ups from satellites or high-powered telescopes on the ground to further assess tile damage but officials say now they just didn't believe it would help and in any event didn't think it was a safety issue it was nbc's jay barbary who this morning first uncovered that nasa engineering report warning of a possible 30 inches of damage unfortunately there are a lot of routine memos like this that are given out daily but in this case they should have paid more attention to it because this could have been the cause of colombia's tragedy in california caltech astronomer anthony beasley watching the shuttle just beginning to descend on saturday believed he saw something already starting to stream off the shuttle i think that uh with the early flickering and the small pieces that seem to be coming off the shuttle i it perhaps at that point it could have been tiles finally beasley thought he saw the shuttle begin to break up nbc's robert hager tonight at the johnson space center in houston suppose nasa did have a safety problem and knew so almost immediately could anything have been done to save the shuttle crew or had they passed the point of no return nbc's chief science correspondent robert mizell has been covering the shuttle program since it started in 1981 and he's here with more on that tonight robert what's

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with more on that tonight robert what's the latest tom the question is what if what if mission controllers had decided that that piece of foam had caused sufficient damage to the heat protective tiles to pose a risk to the crew booster ignition and liftoff of space shuttle columbia minutes after launch the shuttle can return to the landing strip at the kennedy space center or cross the atlantic to an air force base in spain but those contingencies are primarily for engine failure and nasa officials say they did not start thinking about possible tile damage until the next day from the inception of the shuttle program experts recognized that loss of tiles could destroy the spaceship because of extreme heat during re-entry for several years astronauts trained with tile repair kits but columbia was not carrying the robot arm or jet backpacks that would have allowed astronauts to get in position for repairs and many doubt it could work a flailing astronaut underneath the space shuttle would probably do more damage than good rescuing the astronauts colombia was not in an

orbit that would have allowed it to hook up with the international space station but nasa could have tried to rush up another shuttle the next mission was planned for about a month from now and colombia had enough supplies for another two weeks or so in space engineers say astronauts from the rescue mission could have carried spacesuits to allow the columbia astronauts to get out that's a science fiction scenario but it's the kind of thing that the people at nasa have done in the past before they make science fiction movies about them a last option columbia could have flown in at an angle to put most of the heat on the undamaged right wing a plan nasa said today would be difficult and highly dangerous but the bottom line is nasa did not consider the problem serious because insulation had struck the shuttle before an astronaut can happen several times and not cause a disaster remember shuttle o rings had failed nine times before that problem destroyed the challenger tom thanks very much nbc's robert brazell

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thanks very much nbc's robert brazell tonight soon after the full extent of the columbia disaster was realized we began to hear that there had been warnings that the shuttle program was pushing the safety limits and those sounding the warnings soon found themselves on the outside looking in why nbc senior investigative correspondent lisa myers now when an expert nasa advisory panel warned almost two years ago that budget cuts threatened to erode shuttle safety more than half of its members were forced out and another quit in protest what was unusual we weren't given very much notice it was done abruptly it never been done abruptly before dr norris krohn says members were upset about being removed in the middle of their terms today nasa administrator sean o'keefe denied members were removed to silence them claiming nasa changed the length of terms well it was again based on this proposition that we really want to infuse fresh new talent to the thought and the consideration of all the things that go on in safety but a nasa consultant involved with the advisory board also dismissed at the time says it felt like a case of shooting the messenger we had been pushing hard on on a number of key issues regarding upgrading this of the space shuttle and that might have played a part in it the advisory report being prepared at the time warned that current and proposed budgets are not sufficient to improve or even maintain the safety risk level of operating the space shuttle a year after the dismissals the then head of the advisory panel dr richard blomberg told congress he'd never been more concerned about eroded budgets and the margin of safety you just never know when you cross that line and gao investigators have warned twice that workforce cutbacks threaten safety even the head of the group that maintains and refurbishes the shuttle told congress i am more pessimistic today than i have been in the 17 years that i have been doing this because the ice is getting thinner under

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because the ice is getting thinner under our feet still in all these warnings from inside and outside the space program no one warned of any problems with this flight or of any immediate dangers to the astronauts in fact the advisory panel explicitly said last year it believed safety had not yet been compromised lisa myers nbc news washington more and more pieces of the space shuttle are being found across a wide patch of texas the debris field is much larger than first thought covering some 28 000 square miles a short time ago they discovered the shuttle's nose cone just outside of hemp hill texas in sabine county which is in east texas nbc's national correspondent jim avila now in one of the east texas towns where this search is underway texas state police boats back on the toledo bend reservoir today bringing divers and metal detectors dragging underwater cameras to search for what a fisherman described as a shuttle piece the size of a small car still no luck even with precise gps coordinates if you've ever dropped a penny or a nickel into a bowl of water and watch what it did once it hit the water that's where we're having having our problems nothing underwater recovered today but on land more than two thousand pieces of shuttle wreckage including this huge ball thought to be a fuel tank found and marked in the east texas woods where the largest concentration of debris fell a slow difficult search in what's called the texas thicket hard to see hard to move it took more than 200 volunteers more than eight hours to comb through just four miles here volunteer search teams noting location of all the large pieces touching nothing some pieces like this shuttle bolt could be explosive the cabin itself was constructed with bolts that were designed to explode in certain situations to free the cabin from other debris this material all collected from local schools

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schools it along with everything else found here will eventually be used to reconstruct the shuttle on chicken wire a jigsaw puzzle technique used investigating the crash of pan m103 among others and yielding critical clues the big pieces came through relatively unscathed and then there's been a couple small pieces like the patch which is amazing an effort experts say may take another six months but starting one careful step at a time in the east texas woods jim avila nbc news amp hill and we have complete coverage of the space shuttle disaster on our website including close-up images of that piece of foam falling from the fuel tank that much more on msnbc.com nbc news in depth tonight an intriguing question many are asking after this latest shuttle catastrophe is it really necessary to send man flights into space can't unmanned missions achieve just as much or more nbc's brian williams is at the johnson space center in houston with our in-depth report caleb schweitzer is six years old and with his family drove here to houston from leander texas because caleb schweitzer wants very badly to someday wear an american uniform in space i spent my whole life thinking about auction astronauts 41 years since alan shepard tested the odds americans are now used to seeing astronauts blast off seven at a time in a reusable spacecraft then float back to earth after accomplishing incredible things but now even during this sad aftermath the loss of seven lives nasa critics are saying it's time to think about leaving people on the ground they say spacecraft should be unmanned science should replace human exploration anything that you want to do in space that you can identify to do you can do better more efficiently more effectively and more cheaply with

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more effectively and more cheaply with automated spacecraft you just don't need people there in fact people become a hindrance to whatever you want to do in space but veterans of the space program like senator bill nelson say there's room for both unmanned spacecraft have their place even as american astronauts look to conquer yet another frontier it's very much a part of our character as a people it used to be that that our frontier was westward but now our frontier is upward and somewhere up there two americans and one russian on the international space station it's behind schedule and over budget but it has its champions for the science that goes on it's serious science it's serious exploration it's always involves risk and danger and the astronaut crew is always aware of that meantime here in houston a six-year-old boy finds the controls are just beyond his reach but he dreams of someday reaching all the way out into space there is no question that in our cars our kitchens our computers were surrounded by science from the space program a lot of it dates back to apollo that's what has some people asking about diminishing returns and here in houston a lot of people find the question unseemly a day away from the memorial service tom thanks very much nbc's brian williams tonight at the johnson space center in houston nbc's kerry sanders was at florida's cape canaveral today and he was given a dramatic demonstration of the tile's effectiveness when they stay in place and jeff this is a real tile from a shuttle first of all it looks like it's made out of styrofoam what's it made out of it's not made out of styrofoam carry it's made out of this material it's called silica so it's a fibrous silica material which what's what's silica sand so each tile is approximately ten percent sand and ninety percent air and how does it work how does it work well to show you some of the properties of this insulating material will use this 2000 degree propane torch and i'll hold it with my fingers and

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and i'll hold it with my fingers and we'll get a pretty good idea what it looks like we'll dim the lights here so there you see that flame hitting it i'm holding by the edge obviously i'm not getting hot but more importantly watch when i take that flame away from that silica cube which the tiles are made of watch what happens what disappears almost instantly is there any blackening or scorching on it nope hold your hand out let me know if it's hot or not like a piece of warm toast there you go nbc's carrie sanders tonight at w it's been a tough couple of years to explain what is going on in this world now the columbia tragedy here's nbc's bob fall as they filed into classrooms this morning america's children tried to come to terms with the shuttle disaster after a moment of silence in space city usa titusville florida fifth graders at the apollo elementary school wrote or drew their feelings about the doomed astronauts i feel really bad for the astronauts family and friends no

one of course can see a dream shattered but in their faces and voices there is a glimpse my heart is broken because those astronauts were brave enough to risk their lives in space for us and not make it back okay the space program built their community more than one job in four here is linked to aerospace though young they understand the risk of exploration better than most i think they should keep going but it's just a matter of time before it happens again maybe yeah that understanding has not dashed their hopes how many have thought about becoming an astronaut do you still want to be an astronaut you're not frightened by what happened they admit terrible images of colombia do linger as seven people went up to space to prove something and then they come back and they die teacher beth faulkner refuses to let her students dwell on the mission's failure they understand that you know this can

01:06:00 (https://www.youtube.com/watch?v=0zQVeqrjJI0&t=3960s)

they understand that you know this can happen it's very sad but we need to move on this day at least in this classroom that approach seemed to work even though we have lost seven men and women i think our space program should go on in hopes of a brighter future for them a future undimmed by the fate of the columbia astronauts i think they're dead but somewhere their spirit will be falling around everybody especially the families america's children trying to cope with catastrophe and at least here succeeded remember them one team they never panic americans ultimate heroes and team players bob fall nbc news titusville florida good evening these are busy and difficult days for america with the chances of war against iraq ever greater the struggle to repair the economy and now the heartbreaking and vexing problem with the columbia space shuttle today at the johnson space center in houston a memorial service for the seven astronauts we learned lost saturday when the columbia disintegrated in the skies over texas we'll have a complete report on that in just a few moments but we want to begin tonight with the investigation two earlier reports warning of the dangers of the loose insulation and the possibility of repairing damage in flight we'll begin with nbc's chief science correspondent robert mazzell a piece of foam insulation striking the shuttle ultimately weakening it so it could not survive re-entry to the atmosphere could nasa have known such a thing could happen in fact a report obtained by nbc news warns of just that written by stanford scientists at nasa's request and published in 1994 it says debonding of insulation on the external tank an event of minor concern could damage critical tiles on the orbiter eventually causing the loss of the vehicle and crew dr paul fischbach now at carnegie mellon was one of the authors one of the primary concerns was this

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one of the primary concerns was this insulation coming off of the external tank uh this debris was in fact had a long history of impacting the orbiter and damaging tiles did nasa heed the warning the agency did conduct tests of pieces of foam striking tiles but a 1997 memo from a nasa engineer warns of continuing danger at liftoff he wrote the insulation becomes a projectile with incredible damage potential this is the insulation it's sprayed on as foam but even at room temperature it's as hard as a rock and on the shuttle's external tank it covers liquid that is 400 degrees below zero the piece that hit the shuttle wing was about four times as large as this and the shuttle was traveling 1500 miles an hour so the piece would have slammed into the wing like a cannonball during the fight nasa specialists did analyze tape and film of the impact concluding it was not a significant problem for the heat protection tiles that keep the shuttle from burning up during reentry what we believe the worst case to be was perhaps a local penetration local structural damage but now as officials pour over the data the foam is the prime suspect for the destruction of columbia and the death of the seven astronauts that's a fairly drastic assumption and it's sobering a sobering realization that the disaster might have been averted robert bezell nbc news new york now to the provocative question is it possible to do repairs on the exterior of the shuttle while in flight as nbc's chief investigative correspondent lisa myers reports tonight in this nbc news exclusive nasa seriously considered that possibility earlier lisa tom nbc news has learned that a study five years ago by the prestigious national academy of sciences urged nasa to do more to develop ways to inspect and repair damage to the shuttle while in orbit but nasa rejected the

01:10:00 (https://www.youtube.com/watch?v=0zQVeqrjJI0&t=4200s)

while in orbit but nasa rejected the recommendation the study focused on space debris and meteoroids and the potentially catastrophic damage even small pieces could do to the shuttle and flight experts involved say that warnings and recommendations also apply to damage caused on liftoff by falling debris in 1997 the panel's chairman warned there is a real risk that a collision could [__] the shuttle or threaten the safety of the crew the report warned that even damages that appeared small could become critical during reentry if they could be detected and repaired in orbit the risk of critical failure could be significantly reduced nbc analyst james oberg says repairs in space are enormously complex but that nasa probably wishes it had made this a priority sure in hindsight give them a time machine send them back five years you're going to probably have a different decision back then you have a different decision last week today a nasa spokesman said the agency seriously considered the recommendation but decided there was a great risk of damaging existing tiles by attempting repairs in orbit another independent report in 2000 warned a faulty wiring on the columbia corrosion throughout the shuttle fleet and found cost cutting may have jeopardized safety in spite of the clear mandate from nasa that neither schedule or cost should ever be allowed to compromise safety the workforce has received a conflicting message due to the emphasis on achieving cost and staff reductions dr henry mcdonald led the team conducting the study well i was clearly disappointed and unhappy that not all of the recommendations that we made were implemented there clearly were some concerns about feasibility and cost of implementation but mcdonald emphasized that nasa itself asked for the study and told him to be thorough he says any suggestion that nasa would knowingly compromise safety is unfair tom thanks very much nbc's lisa myers tonight that brings us back to the status of the

01:12:00 (https://www.youtube.com/watch?v=0zQVeqrjJI0&t=4320s)

that brings us back to the status of the investigation into what went wrong this time the continuing focus on foam and tiles and on some very large pieces of the shuttle that now have been recovered nbc's robert hager is live again tonight from the johnson space center in houston robert tom nasa tonight says it has citizen reports of pieces of the shuttle being found as far west as california and arizona maybe even parts of the shuttle's wing the agency's dispatched investigators to check this immediately for clues to what they call the missing link if tiles did come off and the shuttle began overheating on reentry what happened next to cause the break off what parts came off first the most significant wreckage found a date the shuttle's nose cone was wrapped in plastic today to be sent to investigators they'll look for any new flight data that could be extracted from its avionic equipment the cone had been found yesterday buried where it hit near the texas louisiana border in reasonably good shape no signs of fire damage this as admiral harold gaiman who heads the independent board appointed to investigate got a first-hand look at other debris today and how each piece is being cataloged and checked for hazardous chemicals game and talked about the importance of the wreckage clearly any debris that we find that is farther up range that is the first dozen pieces that fell off would be of great interest meantime pictures of the earliest moments of the shuttle accident emerged there it is oh it's cool from a family who'd gone out to videotape it saturday morning in phoenix arizona look at the chunks coming off of it yeah what the heck is that i don't know investigators hope they'll eventually find enough to reconstruct colombia's wreckage when twa 800 crashed off long island divers hauled up 95 of the plane for more than 100 feet underwater and created a massive reconstruction that helped prove that plane had not been down by a missile or a bomb and when pan m103 crashed wreckage was

01:14:00 (https://www.youtube.com/watch?v=0zQVeqrjJI0&t=4440s)

and when pan m103 crashed wreckage was strewn over hundreds of miles of scotland but enough was gathered and reconstructed to clearly locate where the bomb was placed that brought that plane down tomorrow investigators hope to have a preliminary report on whether there's any important information on a final 32 seconds worth of data sent down from the crippled shuttle after all the other contact had been lost tom robert hager in houston tonight thanks very much now today's memorial service president and mrs bush joined family members and thousands more at the johnson space center under a clear blue sky to say goodbye to the astronauts who died on saturday nbc's brian williams is in houston tonight it had the feel of a small family hurting from a loss closing in on itself in grief [Music] they loved each other like a family it was a great mission they were almost home you know almost home under a sparkling texas sky they gathered to

say farewell to seven of their own in the crowd the faces of nasa's glorious past older now but still instantly recognizable for that first orbit that first footprint on the moon they remembered another first among them israel's first shuttle astronaut elon ramon who they said made those around him that much better he was the perfectly poised fighter pilot with the sparkle in his eyes laurel she had a perpetual smile and would never send an email or phone if she could find you in person

01:16:00 (https://www.youtube.com/watch?v=0zQVeqrjJI0&t=4560s)

if she could find you in person mike because he was quiet we all loved to see him laugh and when he laughed we laughed with him even harder kaltner loved lying small airplanes with her husband and loved flying in space smiling dave her doc to his friends quiet and observant with piercing blue eyes willie known for his tremendous consideration for others he enjoyed surprising people with flowers and hawaiian lays rick i grew to really appreciate all of his talents his gifts and laugh at all of his amarillo sayings the president faced with yet another intensely emotional domestic tragedy delivered a forceful defense of america's mission in space this cause of expiration and discovery is not an option we choose it is a desire written in the human heart faced with the wrenching site of the grieving families in the front row the president delivered a message directly to those who've been left behind the 12 young people whose parents were on board the shuttle columbia and to the children who miss your mom or dad so much today you need to know they love you and that love will always be with you when it was over the attention of the mourners was directed skyward one final time the toughest part of the president's day came later a private reception just for immediate family no cameras no outsiders one former astronaut here today said you know nasa families are just like any other except of course for the part about the constant threat that is always with them tom thanks very much nbc's brian williams tonight in houston when you read the bios of the seven columbia astronauts

01:18:00 (https://www.youtube.com/watch?v=0zQVeqrjJI0&t=4680s)

columbia astronauts lost over the weekend it is a humbling experience it's also an inspiration especially at a place like the u.s naval academy the alma mater of willie mccool cross-country star number two in his class nbc's roger o'neill tonight on the birthplace of so many astronauts 8 a.m morning colors at the naval academy and today at the navy chapel mourning the loss of one of their own colombia's co-pilot william willie mccool class of 83 an astronaut with the right stuff from an academy that grooms america's sharpest and brightest young stars the naval academy is a breeding ground for future astronauts from america's first alan shepard stuffed into his freedom 7 space capsule 50 more graduates have followed more than any other university in the country the airplane's oscillating captain rob kneewarner says fully half the midshipmen studying aerospace engineering want to be astronauts it's those who have this insatiable thirst to know and understand more who are going to go on commander mccool like the midshipmen who are following in his footsteps takes service to country seriously honor courage commitment aren't just words they are the navy's core value do you all want to be astronauts yes yes yes did the loss of colombia and the seven astronauts cause any pause in those dreams i understand there's a risk in this profession that's why i came into the military and that's why i want to be an astronaut and i'm willing to accept that risk senior bryce abbott junior jennifer hammer and senior harry evans accept the risk of space to pursue their dreams with great endeavors become great risk being an astronaut is just the pinnacle to reach that dream and just be a true accomplishment author tom wolf's book and the movie that followed americanized the british phrase the

01:20:00 (https://www.youtube.com/watch?v=0zQVeqrjJI0&t=4800s)

americanized the british phrase the right stuff watch words of nerve skill and grace under pressure people who are willing to risk their lives but with a certain talent a certain moxie when the next class of a thousand midshipmen graduate in may the tossing of their hats will be more than a symbol of accomplishment it will be a signal of another group of naval officers just like willie mccool ready to reach for the stars roger o'neil nbc news annapolis right tom well nasa tonight says it just cannot believe that insulation coming off the exterior fuel tank and knocking tiles off the underside of this wing would be enough to cause his accident alone could have contributed but there must have been something else as well right now it just does not make sense to

us that a piece of debris would be the root cause for the loss of colombia and its crew there's got to be another reason meantime a grim flight nasa says remains of what it believes may be all seven astronauts have now been tentatively identified and were flown at midday to the mortuary at dover air force base in delaware in flag-draped coffins as for wreckage nasa's most interested in what may be found hundreds of miles west of texas and so could indicate what was coming off the shuttle first in joshua tree california local officials held aloft this small piece of debris found in a backyard and said nasa was interested we described it to them on the phone and they seem to feel that it could be from this from the shuttle they said it was consistent with something uh some part of the shuttle and about that home video we showed you last night that is cool it was taken saturday by a father and son in flagstaff arizona and appears to show something coming off

01:22:00 (https://www.youtube.com/watch?v=0zQVeqrjJI0&t=4920s)

and appears to show something coming off the shuttle long before it reaches texas look at the chunks coming off of it yeah what the heck is that i don't know nbc analyst james oberg for years a nasa engineer makes this observation the shuttle goes across the screen with little sparks coming off but they drop back real fast that tells me they're real light the only light things on the outside of the shuttle are these tiles but again nasa believes there must have been something else as well one of the development the father of the israeli astronaut says nasa told him the astronauts would have had from 60 to 90 seconds after realizing something was drastically wrong to the end but nasa says it can't confirm that tom thanks very much nbc's robert hager tonight we're still looking for that elusive missing link so where can nasa turn now for more pieces of the puzzle start with analysis of 1300 images it's collected of what happened that day like this videotape taken in st george utah and obtained by nbc news and they'll be in florida in about five minutes now watch as something appears to separate from the shuttle well you see crap falling off of it here again in slow motion yet another perspective from amateur astronomer jay lawson in sparks nevada there was some debris and smoke trails in the ion trail from the shuttle as it was landing and it appeared that there was something going wrong nasa is also trying desperately to interpret a final 32 seconds of garbled data sent from columbia after all other contact was lost and particularly hoping some piece of wreckage could explain what happened especially what came off first phone calls have been flooding in from people who think they've found debris steve volden with the arizona department of public safety we have approximately 125 calls that have come into the last three days and of those we're probably looking about five percent as being really hot tips for us to check out and nasa can't confirm anything found west of texas yet that it knows came off the shuttle

01:24:01 (https://www.youtube.com/watch?v=0zQVeqrjJI0&t=5041s)

knows came off the shuttle as for all the video it's collected nasa says it has to be careful to verify first which pictures are real then if it decides some actually do show pieces being shed they may be able to calculate the potential track down and then know where to look for the pieces that might ultimately lead to them lead them to some answers here tom thanks very much nbc's robert hager tonight now the latest on the shuttle columbia the explosion the loss of seven lives two major new pieces of evidence today one photograph and one real piece of the doom shuttle's wing nbc's robert hager is at the johnson space center for us again tonight robert what's the latest there the photo first time it's a new telescopic image of the shuttle that was taken just a minute and three quarters before all contact was lost it was given to nasa by the air force last weekend actually a number of these images were but it was just released today in one image that was shown to nbc earlier today you could see jagged damage on the wing was clearly visible but the image that nasa released tonight was much more blurry less conclusive and nasa says so far it can't see a problem it was captured here at kirtland air force base in albuquerque by a telescope powerful enough to see foot wide details 600 miles away technicians hadn't been asked to follow the shuttle they were just by chance trying out a new tracking system this is the image the shuttle's being seen from its underside so the left wing the one some believe could have been damaged is on the right side of this image some believe they can see a jagged area here though nasa says it's not sure by any means the dark areas behind may be from the shuttle's thrusters firing automatically the one behind the damaged wing bigger to offset drag or wind

resistance from that damage if there were jagged edges on the wing that could have let in enough torch-like heat of the atmosphere to doom the craft says purdue university's steven schneider just keeps getting worse and worse and

01:26:00 (https://www.youtube.com/watch?v=0zQVeqrjJI0&t=5160s)

just keeps getting worse and worse and more and more things are damaged by this heating and more heat gets in until the vehicle disintegrates but nasa's ron dittemore says he's puzzled by the image i'm hopeful that as the experts look at these photographs maybe they can tell us something about the state of the vehicle meantime an important find in the wreckage it's a piece of the leading edge of the wing so it could be in that area of damage it's 26 inches long 18 inches wide with some heat tiles attached it was found near fort worth but this is crucial they don't know yet if it's from the suspect left wing or from the right tom and bob next week the investigation moves to washington what can we expect then now a lot of fireworks on capitol hill there's a big hearing on wednesday joint hearing by senate and house committees and not only will they be asking about the investigation but probably a lot about nasa's future and here we've been told we had our last briefing tonight they're really turning it over now to the independent commission made up of other government officials but not nasa officials all right thanks very much nbc's robert hager tonight in houston nbc news in depth tonight the continuing investigation into the space shuttle columbia tragedy it's been a week now since it disintegrated in the skies over texas killing all seven astronauts on board and while nasa officials have various ideas about what went wrong they're still looking for their own smoking gun that could explain what went wrong nbc's robert hager reports from houston seven days after those frightening streaks over texas that shocked us all there's still no clear explanation for what went so terribly wrong the most solid evidence so far the last seven minutes of data beamed down as columbia slammed back into the atmosphere its bottom tiles red hot suddenly sensors detected heat penetrating they failed one by one on the left side the nose started to point to the left damage might have created wind resistance the flaps waved automatically to counter this thrusters fired but still it pointed

01:28:01 (https://www.youtube.com/watch?v=0zQVeqrjJI0&t=5281s)

thrusters fired but still it pointed more and more dangerously to the left nbc news consultant james oberg who worked in mission control for 22 years watching those lights go out the temperatures go from cold to hot one after the other over this period is a is a terrifying view because clearly something bad is getting worse and worse and worse until it overwhelmed colombia and it broke up the other principal piece of evidence the video from liftoff showing insulation ripping off and striking the wing within days nasa calculated it could have damaged up to 30 inches of tile but nasa said not enough to be a safety concern some experts take issue with that finding they believe what happened at the beginning the insulation coming off and striking under the wing on the tiles is enough to explain the end those final seven minutes and break up but others say it's not enough that there must be a missing link something that happened in between so where to turn now there are more than thirteen hundred videos and stills to be analyzed many taken before those final seven minutes one crucial image captured by a powerful air force telescope where some believe they see signs of damage to the left wing then there was for time hope of making sense of a final 32 seconds of garbled data that continued to beam down after all other contact was lost but now it turns out to be only one second of data and it's still garbled and finally there's the wreckage the hope of finding some piece or pieces to complete the puzzle so far a lot's been gathered but nothing identified as a shuttle part yet found west of texas under the earliest stage of reentry and despite all the effort nothing of any real help other than one small section of wing and it's not clear yet whether it's from the crucial left side a week's gone by it could take many more to get answers robert hager nbc news at johnson space center in houston now to the space shuttle investigation new details about the columbia tragedy were revealed today that might explain

01:30:00 (https://www.youtube.com/watch?v=0zQVeqrjJI0&t=5400s)

were revealed today that might explain what caused the shuttle to break apart nbc's robert hager has more the new information comes from incredible detective work deep under cheyenne mountain in colorado at norad the air force tracking center with help from radar at eglin air force base in florida technicians there can see more than 150 000 pieces of debris in space at any one time now from among the scores that fall toward earth each week they found one small blip that entered the atmosphere and burned up on january 19th three days after columbia was launched tracing it back the technicians were astounded to find this blip appeared to come off the shuttle two days earlier january 17th come off at about 11 miles an hour that was barely 24 hours after liftoff donald kessler who tracked space debris for nasa for three decades well anything that has a very low departure speed from the shuttle almost certainly came from the shuttle it could have been knocked off by a collision with a tiny piece of meteor or space junk but that's a long shot especially since the shuttle was cruising upside down and tail first to protect against oncoming debris more likely something loose came off the shuttle or floated out from its open cargo bay the shuttle was not dumping water at the time so if it was ice it wasn't from that the crew said nothing on the radio about anything unusual no unusual data was beamed down from the shuttle so what could it have been a wrench that came out of the cargo bay or it could be a tile that did come off of the shuttle and if whatever it was took two more days to fall out of orbit that means it was very light less than a few ounces to something that weighs of the order of a half a pound to a pound eventually more analysis of the radar could yield valuable additional information yes in general it is possible to pull out more information about shape the question now was it something harmless or something that could have made the shuttle vulnerable on re-entry and contributed to or even

01:32:00 (https://www.youtube.com/watch?v=0zQVeqrjJI0&t=5520s)

on re-entry and contributed to or even caused this terrible accident robert hager nbc news johnson space center in houston now to the space shuttle investigation nasa confirms that a piece of a wing found late last week was indeed from the shuttle's left wing the one investigators have been focusing on since the disaster nbc's robert hager with more on the bits and pieces of key evidence that could reveal what went so wrong investigators here say they're trying to sharpen the blurry air force telescope image released friday that shows the shuttle less than two minutes before contact was lost some believe they can see wing damage nasa's michael costelli today i think they're going back now and trying to enhance some of the image we have this is our artist drawing of one image already enhanced that was shown to nbc that image included the word protuberance pointing to a jagged part of the wing and the words asymmetric plume pointing to a dark streak coming off the wing nasa said today that one small piece of wing it's found is from that side no report on damage and also said it's found one of the shuttle's computers which could be important meantime the chairman of the independent government board now taking over this investigation retired admiral harold gaiman told nbc news there are additional potentially more revealing images to come from military and other sources we have we have been made aware of the existence of more photography than has been than we've gotten our hands on it's end route to us and today a first close-up tour of shuttle wreckage for reporters at a hangar at barksdale air force base in louisiana the windows of the cockpit a huge number of badly charred heat shielding tiles a ring from a hatch door charred metal beams and a piece of landing gear each part is described and prepared for shipment to cape canaveral 30 inches long seven and a half inches wide already a hangar has been set aside at

01:34:00 (https://www.youtube.com/watch?v=0zQVeqrjJI0&t=5640s)

already a hangar has been set aside at the cape with a taped outline of columbia on the floor ready for its shattered pieces to be reassembled so investigators could try to understand how or why it came apart robert hager nbc news johnson space center in houston at the johnson space center tonight nasa has released tapes of the final moments of the exchanges between flight controllers and the doomed space shuttle columbia nbc's robert hager joins me now from houston bob what's the latest there tom this is the never before heard audio tape of what controllers were saying to each other in houston's mission control from the first sign of trouble until the realization that the shuttle was lost it starts about six minutes before contact with the shuttle breaks off a controller notices sensors that monitor systems on the spaceship are failing fyi i've just lost four separate temperature transducers on the left side of the vehicle hydraulic return temperatures

we just lost tire pressure on left outboard and left and board both tires in columbia houston we see your tire pressure messages and we did not copy your laptop but controllers don't yet realize the gravity of the situation until next the crackle of static is heard as the shuttle may be breaking up followed by efforts to reach the astronauts or find them on radar with no success listen didn't expect uh this bad of a hit on com columbia houston comcheck columbia houston uhf comcheck have we gotten any tracking data we got a blip of tracking data it was a bad data point slide we do not believe that was the orbiter we do not have any valid data at this time by now the shuttle's been missing more than 10 minutes the impact of what's happened is sinking in in mission control emergency procedures begin lock the doors do you have any

01:36:01 (https://www.youtube.com/watch?v=0zQVeqrjJI0&t=5761s)

lock the doors do you have any information or reports from space command no phone calls off-site no data no phone calls no transmissions anywhere into or out two hours later the flags at cape canaveral are lowered to half staff and the shuttle is declared lost today ten days later the new investigative board taking over this probe promise to do all it can to get it right find out what caused this tom thanks very much nbc's robert hager tonight out of the space shuttle investigation and a day of aggressive and tough questions from congress for the man in charge at nasa the focus wasn't on the cause of the disaster but on whether budget cuts may have slowly but surely laid the foundation for the explosion here's nbc's robert hager as first debris arrived at cape canaveral today for reconstruction in washington a joint congressional committee grilled nasa administrator sean o'keefe for four hours are the shuttles too old was this the shuttle's age a 30 year old system a major factor in this tragedy o'keefe bristle it was half the age of the average bomber aircraft that flew in afghanistan just a year ago about the tiles nasa's had a long history of problems with the shuttle heat tiles were they damaged by insulation striking the wing probably not o'keeffe said so it's the functional equivalent as one astronaut described to me of a styrofoam cooler blowing off of a pickup truck ahead of you on a highway what about the independent investigators nasa appointed under admiral harold gaiman an agency can't very effectively investigate itself he'll be reporting to the president to the congress to the american people to all of us but the toughest questions about budget from a senator who once flew in space florida's bill nelson the space shuttle

01:38:00 (https://www.youtube.com/watch?v=0zQVeqrjJI0&t=5880s)

florida's bill nelson the space shuttle budget was whacked by some 1.4 billion dollars he pointed to a card listing each cut does that compromise safety no o'keefe argued until now safety had been improving an ethos of safety is evident throughout the agency so i can tell you there are people at nasa and in the astronaut office that feel like that safety has been compromised over the last 10 years as a result of the space shuttle budget being rated and that's something that we've got to be concerned about now too late some say both congress and the president are racing to increase nasa's budget robert hager nbc news washington we identified there is a major new finding about why colombia suffered catastrophic overheating on its descent through the earth's atmosphere we want to go to nbc's dan molina at the johnson space center in houston tonight dan good evening good evening to you brian we've known almost from the beginning that in the chain of events preceding the breakup of columbia mission control recorded a very strange 60 degree rise in temperature in the left wheel well that's located right here the question is why did that temperature rise occur and today the accident investigation board says that they are very actively looking into the possibility that some sort of breach of columbia's skin occurred the question is why when colombia re-entered the atmosphere like all shuttle flights the shuttle is surrounded by what's called plasma which is super heated gas the maximum heating during reentry is about 2500 degrees now the aluminum skin would melt at about 900 degrees so if there were some breach in the aluminum skin that could have resulted in the catastrophe now the accident investigating board today was very careful to point out that the loss of one of colombia's thermal protection tiles would not have been sufficient to

01:40:02 (https://www.youtube.com/watch?v=0zQVeqrjJI0&t=6002s)

tiles would not have been sufficient to cause that breach that wouldn't have been enough area exposed they very carefully though avoided talking about the possibility that a larger section of the skin may have been missing something like two square feet so the question is did superheated plasma gas enter the shuttle through a breach causing the catastrophe we will hear more about that tomorrow brian from lead from entry flight director leroy kane dan molina in houston for us tonight thanks there are new developments tonight in the space shuttle investigation nasa revealed that at least four small control jets on the shuttle continued to fire in the shuttle's final moments trying to stabilize the craft and in the mountains near albuquerque searchers were out today looking for any debris that might have landed the last voice communication from the shuttle came as it was passing over new mexico investigators said today they now know the first pieces of the doom shuttle columbia started breaking off when the orbiter was over california that's at least eight minutes before all contact with mission control was lost over texas also today that same independent board investigating the disaster confirmed damage to the heat protection tiles must have been part of the chain of events leading up to the breakup is a major development tonight in the investigation of the break of the the space shuttle columbia nasa has released an email from one of its safety engineers that warned that the shuttle was at risk three days before it disintegrated in the skies over western america nbc's dan molina joins me now from the johnson space center in houston and what's the latest there well tom what we have here is part of a stream of information that is coming to the surface as both nasa and the news media examine the possible causes of the columbia tragedy the newly released emails from nasa engineer robert dougherty examined the possibility of a breach in here the columbia's left wheel well now

01:42:01 (https://www.youtube.com/watch?v=0zQVeqrjJI0&t=6121s)

here the columbia's left wheel well now this information was released to the news media under the freedom of information act the last communications were received the email is from an engineer at nasa's langley research facility he said there was no way to know of course but these were his words it seems to me that if mission operations were to see both tire pressure indicators go to zero during entry they would sure as hell want to know whether they should land with gear up try to deploy the gear or go bail out on february 1st in mission control these words referring to those indicators we just lost uh tire pressure on left outboard and left-hand board both tires also today the release of documents showing that columbia may have been struck by as many as three large chunks of foam not one during liftoff mr doherty complained in another email that nasa is complaining that nasa is treating information like his quote like the plague unquote indeed tom nasa admits that that email warning about the pressure inside the wheel well did not reach mission control thanks very much nbc's dan molina tonight at the johnson space center in houston now to the space shuttle investigation nbc's dan molina has exclusive information tonight about nasa's plans for getting the spacecraft back into orbit and about problems the russians are encountering with making sure they can send missions to the space station while america's program is getting back on track four three how long will it be before we see this happen again booster ignition and liftoff it might be sooner than many people thought nbc news has obtained notes from a nasa management teleconference last thursday ron dittamore manager of the shuttle program is quoted as saying when we will fly again i have been telling people summer time frame the notes also showed did a more directing colleagues to develop a way to inspect heat protective tiles in flight

01:44:01 (https://www.youtube.com/watch?v=0zQVeqrjJI0&t=6241s)

tiles in flight probably by an astronaut during a spacewalk if damage is detected dynamo indicated nasa needs a plan to dust off repair capability for tiles in flight this means that evidence from the disaster may be pointing to the conclusion that what happened can be fixed on future flights columbia was not equipped for the kind of inspection and repair that's now being discussed if the shuttles can fly again even by the end of this year that would be very welcome news not just for the shuttle program but also for those who are very concerned about the well-being of this the international space station nasa had expected to send a replacement crew and supplies to the space station on a russian soyuz spacecraft on april 26th now the russians are saying funding problems will delay that launch until early may and they want more money for additional russian spacecraft if the american shuttles remain grounded we have 16 partners engaged in this we're all negotiating and everybody's acting like a partner it's it's working exactly as we hoped it would ten

years ago nasa was told to build the space station impossible to operate without the russians now we have no choice but to find a way to send them the extra money they need nasa sources also tell nbc news that new details of columbia's breakup are emerging it now appears that the crew compartment was intact through a complete end over end tumble and for several seconds after that currently uh dan molina nbc news at the johnson space center houston and back in this country there is new information tonight on the loss of the space shuttle columbia including some tantalizing new clues found in the wreckage nbc's robert hager is in houston tonight now found with other wreckage two tiles from a wing the earliest pieces to come off the shuttle that have been located to date one found in powell texas and described by chief investigator admiral harold gaiman this is the underside of the tile this is the tile which is near the metal surface what appears to be at the

01:46:02 (https://www.youtube.com/watch?v=0zQVeqrjJI0&t=6362s)

metal surface what appears to be at the ends are essentially worn away probably by hot gases that's how's other side underneath fiercely burned way beyond the searing caused by a normal re-entry it's being analyzed right now including what those little orange specks are this is very unusual a second wing tile's also been found in west texas in littlefield so it too would have come off the shuttle early and at cape canaveral a nasa engineer has told nbc's j barbary of another suspicious discovery engineers you're combing through debris from columbia's left wing say they have found a hole in the top of that wing now if as they believe this occurred in orbit columbia could have been hit by something coming off the shuttle or even space junk now there's news of a last videotape of colombia's crew taken just at the start of reentry 13 minutes worth that shows normal activity nothing unusual the tape ends before the trouble starts the tape was found in the wreckage partially burned it's being shown now to the astronauts families and will be released to the public in the next few days meantime nasa is using small models of a shuttle in a powerful wind tunnel that can simulate flight conditions at six times the speed of sound to try to understand more about forces the shuttle faced just before breakup investigators here say they're beginning to make progress but admit they're still a long way from finding the ultimate answers robert hager nbc news johnson space center in houston investigators trying to solve the mystery of how the space shuttle columbia was lost released an intriguing photo today of a piece of the wreckage it is a piece of the underside of the shuttle's left wing specifically the corner of the left main landing gear the door the crescent shaped area at the bottom of the photo shows a piece of the thermal protection missing investigators are interested in this because it may help determine how super hot gases entered the shuttle's

01:48:00 (https://www.youtube.com/watch?v=0zQVeqrjJI0&t=6480s)

super hot gases entered the shuttle's wheel well

END